MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2017 / 2018

PCO0165 – INTRODUCTION TO COMPUTER ARCHITECTURE AND OPERATING SYSTEM
(Foundation in Information Technology)

23 OCTOBER 2017
9.00 a.m – 11.00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 3 pages (excluding the cover page) with 5 questions only.

2. Answer **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please write all your answers in the Answer Booklet provided.

Instructions: Answer **ALL** questions. Write your answers in the Answer Booklet.

QUESTION 1 [10 Marks]

a. Machine cycle defined to be the time taken by CPU to do basic operations. Explain the difference between I-time and E-time.   (1 mark)

b. List and describe the major components of a CPU   (4 marks)

c. Processor organization describes the interconnection of the major components of a CPU to the rest of the computer system via the system bus. List and briefly describe the tasks that the CPU must perform.   (5 marks)

QUESTION 2 [10 Marks]

a. Convert the following decimal notations to their binary equivalents. Show computation steps.
   i. 252_{10}
   ii. 9.25_{10} (4 marks)

b. Convert the following binary numbers to decimal equivalents. Show computation steps.
   i. 11101011.001_2
   ii. 10011111.011_2 (3 marks)

c. Convert the following hexadecimal notations to their binary equivalents. Show computation steps.
   i. $59F.9A_{16}$
   ii. $4DB.25_{16}$

                                                                        (3 marks)

QUESTION 3 [10 Marks]

a. Calculate the addition arithmetic operation of the following unsigned binary numbers. Show computation steps.
   i. $00011010 + 00001100$
   ii. $00010011 + 00111110$ (2 marks)

Continued...

b. Calculate the subtraction arithmetic operation of the following unsigned binary numbers. Show computation steps.

   i.   00100101 – 00010001

   ii. 00110011 – 00010110   (3 marks)

c. Solve the following addition operations using the two's complement addition in 5-bit for signed integer. Show computation steps.

   i. $4 + (-8)$

   ii. $(-3) + (9)$

                                                             (3 marks)

d. Solve the subtraction operation $(-8) - (-4)$ using the two's complement subtraction in 4-bit for signed integer. Show computation steps.

                                                            (2 marks)

QUESTION 4 [10 Marks]

a. There are five addressing modes used in the 8085 microprocessor. Describe the following addressing modes. Give an example for each of the addressing mode.

   i.   Direct addressing

   ii. Indirect addressing   (2 marks)

b. Write an assembly program based on the following instructions:

     1. Store the first data 20H into register B.
     2. Store the second data 32H into register C.
     3. Increment the register B.
     4. Decrement the register C.
     5. Store the content of register B into memory location 7000H.
     6. Store the content of register C into memory location 7001H.
     7. Load both data from memory to register pair HL.
     8. Exchange the contents of register pair HL with register pair DE.
     9. Terminate the program.   (8 marks)

QUESTION 5 [10 Marks]

a. Explain the difference between multiprocessing and multitasking operating systems.   (2 marks)

b. Explain the disk defragmenter utility and give **ONE (1)** reason why disk defragmentation is needed.   (3 marks)

Continued...

c. There are three methods for the file access. Explain **TWO (2)** of these methods.

(2 marks)

d. Discuss **THREE (3)** functions of an operating system.   (3 marks)

End of Paper